

REMARKS

Applicant has carefully considered the Office Action, and respectfully submits that the subject application is in condition for allowance based upon the following remarks.

Status of Claims

The subject application was originally filed with 29 claims. In a Preliminary Amendment dated December 13, 2005, Applicant cancelled claims 1–29 and added new claims 30–58. In subsequent Amendments, Applicant amended claims 30, 36, 42, 51, and 56, and cancelled claims 33 and 47. Claims 30–32, 34–46, and 48–58 remain pending in the subject application.

Summary of Office Action

In the Office Action dated June 28, 2010, the Examiner:

- (1) rejected claim 30 under 35 U.S.C. § 112, ¶ 2;
- (2) rejected claims 30–32, 34–40, 42–44, 46, 48–52, and 55–57 under 35 U.S.C. § 103(a) as being unpatentable over GB Patent No. 2,265,959 issued to Pardy (“Pardy”) in view of U.S. Patent No. 6,340,510 issued to Hess (“Hess”); and
- (3) rejected claims 34, 41, 45, 53, 54, and 58 under 35 U.S.C. § 103(a) as being unpatentable over Pardy in view of Hess and further in view of U.S. Patent No. 6,176,147 issued to Ozeki (“Ozeki”).

35 U.S.C. § 112 Rejection

The Office rejected claim 30 under 35 U.S.C. § 112, ¶ 2 as being indefinite for the use of the term “large.” Applicant respectfully traverses this rejection. Applicant submits that the term “large deformation” has a specific meaning to a person having ordinary skill in the art—it is associated with deformations that can arise during flexing, for example, and involves an order of magnitude of more than 1%. A large deformation is opposed to small deflections that arise during the tension or compression of typical materials which are below this magnitude. This difference of scale is addressed in the specification at p. 4, line 29 to p. 5, lines 19, where the difference between “impulsive or vibrational pressure disturbances” is compared to “wall stretching of a conventional hose.”

For at least this reason, Applicant respectfully requests that the rejection under 35 U.S.C. § 112 be withdrawn.

35 U.S.C. § 103(a) Rejections

As discussed above, claims 30–32, 34–40, 42–44, 46, 48–52, and 55–57 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Pardy in view of Hess. For at least the following reasons, Applicant traverses this rejection.

Claims 30–32 and 34–40

Independent claim 30 recites a “peripheral wall is configured to contain fluid and includes interwoven strands configured to be displaced relative to each other during large deformations of the cross-sectional shape of the hose and to absorb deformation energy as frictional loss between the strands.” (Emphasis added.) The Office concedes that Pardy fails to teach a wall including interwoven strands, and instead relies on the sleeving of Hess for this limitation, asserting that a person having ordinary skill in the art would combine the teaching of Pardy with Hess to increase the strength/resistance of the hose wall. (Office Action at 3–4.) However, the claimed interwoven strands of the invention are not for strengthening the hose, they are for absorbing deformation energy from large deformations caused by pressure pulses.

In fact, the sleeving of Hess would fail to absorb deformation energy as claimed. Hess describes a closely woven fabric of hybrid yarns, especially glass combined with a thermoplastic, which are resiliently set. (Hess, col. 1, line 62; col. 2, lines 3–10.) In other words, once the material has set it will permanently retain its shape and will resiliently return to this shape if a force is applied and then removed. (Hess, col. 2, lines 18–26.) A described alternative using stainless steel wire would still have this property. (Hess, col. 2, lines 27–33.) The orientation of the yarns is shown in Figure 1 and comprises a set of longitudinal yarns parallel to the conduit axis and a set of hoop yarns extending around the circumference of the conduit. (Hess, col. 2, lines 58–60.) Since the woven yarns are heated above the glass transition temperature and then cooled to set, it is implicit that the two sets of perpendicular yarns will fuse at their intersection, as is normal for such a material. (Hess, col. 3, lines 50–58.) Hess also states that the sleeve may be coated after setting to seal and give body to the fabric. (Hess, col. 3, lines 58–64.)

In light of these teachings, the yarns in Hess cannot rub together to absorb energy if the conduit were to internally expand. The yarns can only stretch to a very limited degree between the intersections to resiliently (elastically) store energy which would then be released back on the conduit (rather than dissipated). Of course, in Hess, such expansion was never contemplated as the fabric is only provided for thermal protection. (Hess, col. 1, line 10.) An analogy is a mesh wrapped around a balloon which is inflated. The mesh will be stretched in its major plane but individual fibers will not contact each other, rather they will move further apart. The fibers will provide a constraint to inflation, therefore increasing the strength and resistance of the system, but make no contribution to absorbing energy. At best, the fabric would store some expansion energy elastically, before returning it but this is undesirable. (See specification, p. 3, lines 8–15.) Therefore, a combination of Pardy and Hess would not provide a conduit having interwoven strands configured to displace relative to each other during deformation to absorb deformation energy, as expressly recited in claim 30.

Further, any stretching of the fabric of Hess is very limited. The disclosed orientation of the hoop yarns means that these yarns would be placed in pure tension during expansion. Tensile strain is of the order of less than 1% for the stiff materials that Hess uses as yarns. The glass or metal material used for the yarns in Hess would be entirely unsuitable for a hose subject to pressure pulses (indeed, brittle glass would fracture well before even a millimeter of stretching). Therefore, a combination of Pardy and Hess would not provide a conduit having interwoven strands which can accommodate the large deformation that arise from pressure pulses, as recited in claim 30.

For at least the foregoing reasons, the combination of Pardy and Hess fails to teach or suggest each and every element of claim 30 and Applicant respectfully requests that its rejection under 35 U.S.C. § 103(a) be withdrawn. Further, claims 31, 32, 34, 35, and 37–40 depend either directly or indirectly from claim 30 and incorporate each and every element therein. For at least the reasons discussed above, Applicant respectfully requests that the rejection of these claims also be withdrawn.

Additionally, claim 36 recites: “in the absence of fluid pressure the first wall parts are arranged to contact each other and fluid passageways remain adjacent the second wall parts.” Neither Pardy nor Hess discloses this element. In addressing this claim, the Office cites to col. 2,

lines 24–26 of Hess, but this passage merely states: “Once set, resiliently set filamentary materials tend to return to the set position in the absence of a restraining counter force.” There is no indication in Hess that the wall parts contact each other in the set position. For at least this additional reason, the combination of Pardy and Hess fails to teach or suggest each and every element of claim 36, and Applicant respectfully requests that its rejection under 35 U.S.C. § 103(a) be withdrawn.

Further, claim 37 recites: “the peripheral wall has a shape defining a generally elliptical cross-section.” The Office asserts that Pardy discloses a generally elliptical cross-section in Figure 4. Applicant respectfully disagrees. Figure 4 of Pardy shows “a tube 32c of flat cross-section.” (Pardy, p. 3, lines 14-16.) A flat tube cannot be fairly described as a generally elliptical cross-section. As one of ordinary skill in the art would understand, an ellipse is a known geometric shape that is distinct from a flat tube. For at least this additional reason, the combination of Pardy and Hess fails to teach or suggest each and every element of claim 37, and Applicant respectfully requests that its rejection under 35 U.S.C. § 103(a) be withdrawn.

Claims 42–44, 46, 48–52, and 55

Independent claim 42 recites a “peripheral wall is configured to contain fluid and includes interwoven strands configured to be displaced relative to each other during deformation of the cross-sectional shape of the hose and to absorb deformation energy as frictional loss between the strands.” The Office concedes that Pardy fails to teach a wall including interwoven strands, and instead relies on the sleeving of Hess for this limitation. (Office Action at 3–4.) However, for the reasons discussed above with respect to claim 30, the sleeving of Hess would fail to absorb deformation energy as claimed.

For at least this reason, the combination of Pardy and Hess fails to teach or suggest each and every element of claim 42 and Applicant respectfully requests that its rejection under 35 U.S.C. § 103(a) be withdrawn. Further, claims 43, 44, 46, 48–52, and 55 depend either directly or indirectly from claim 42 and incorporate each and every element therein. For at least the reasons discussed above, Applicant respectfully requests that the rejection of these claims also be withdrawn.

Further, claim 50 recites: “the peripheral wall has a shape defining a generally elliptical cross-section.” The Office asserts that Pardy discloses a generally elliptical cross-section in Figure 4. Applicant respectfully disagrees. Figure 4 of Pardy shows “a tube 32c of flat cross-section.” (Pardy, p. 3, lines 14-16.) A flat tube cannot be fairly described as a generally elliptical cross-section. As one of ordinary skill in the art would understand, an ellipse is a known geometric shape that is distinct from a flat tube. For at least this additional reason, the combination of Pardy and Hess fails to teach or suggest each and every element of claim 37, and Applicant respectfully requests that its rejection be withdrawn.

Additionally, claim 51 recites: “in the absence of fluid pressure the first wall parts are arranged to contact each other and fluid passageways remain adjacent the second wall parts.” Neither Pardy nor Hess discloses this element. There is no indication in Hess that the wall parts contact each other in the set position. For at least this additional reason, the combination of Pardy and Hess fails to teach or suggest each and every element of claim 51, and Applicant respectfully requests that its rejection be withdrawn.

Claims 56 and 57

Independent claim 56, as amended, recites “providing the peripheral wall with a construction configured to contain fluid and including interwoven strands configured to be displaced relative to each other during deformation of the cross-sectional shape of the hose and to absorb deformation energy as frictional loss between the strands.” The Office concedes that Pardy fails to teach a wall including interwoven strands, and instead relies on the sleeving of Hess for this limitation. (Office Action at 3–4.) However, for the reasons discussed above with respect to claim 30, the sleeving of Hess would fail to absorb deformation energy as claimed.

For at least this reason, the combination of Pardy and Hess fails to teach or suggest each and every element of claim 56 and Applicant respectfully requests that its rejection under 35 U.S.C. § 103(a) be withdrawn. Further, claim 57 depends directly from claim 56 and incorporates each and every element therein. For at least the reasons discussed above, Applicant respectfully requests that its rejection be withdrawn.

Claims 34, 41, 45, 53, 54, and 58

As discussed above, claims 34, 41, 45, 53, 54, and 58 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Pardy in view of Hess and further in view of Ozeki. For at least the following reasons, Applicant traverses this rejection.

Claims 34 and 41 depend directly from independent claim 30 and incorporate by reference all of the elements from this claim. The combination of Pardy and Hess fails to disclose or suggest each and every element recited by claim 30 for the reasons discussed above. Ozeki fails to provide these missing elements. Accordingly, Applicant respectfully requests that the rejection of claims 34 and 41 under 35 U.S.C. § 103(a) be withdrawn.

Claims 45, 53, and 54 depend directly from independent claim 42 and incorporate by reference all of the elements from this claim. The combination of Pardy and Hess fails to disclose or suggest each and every element recited by claim 42 for the reasons discussed above. Ozeki fails to provide these missing elements. Accordingly, Applicant respectfully requests that the rejection of claims 45, 53, and 54 under 35 U.S.C. § 103(a) be withdrawn.

Claim 58 depends directly from independent claim 56 and incorporates by reference all of the elements from this claim. The combination of Pardy and Hess fails to disclose or suggest each and every element recited by claim 56 for the reasons discussed above. Ozeki fails to provide these missing elements. Accordingly, Applicant respectfully requests that the rejection of claim 58 under 35 U.S.C. § 103(a) be withdrawn.

CONCLUSION

In view of the remarks above, it is believed that claims 30–32, 34–46, and 48–58 are in condition for allowance and notice to such effect is respectfully requested. If the Examiner thinks a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned at the phone number provided below.

If any fees are due in connection with this Amendment, the Commissioner is authorized to charge Deposit Account No. 02-2051, specifically identifying Docket No. 29390-1.

Respectfully submitted,

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